

STUDY OF THE INCIDENCE OF INFARCTION VERSUS HAEMORRHAGE IN ACUTE STROKEPutta Suresh¹, C. Yamini Devi², C. Ramesh Kumar³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: INTRODUCTION: Cerebrovascular disease is the third most common cause of death in the developed world after cancer and ischaemic heart disease. Stroke is a common medical emergency with an annual incidence of between 180 and 300 per 100000. **AIMS AND OBJECTIVES:** To know the incidence of infarction and haemorrhage in acute stroke. **MATERIALS AND METHODS:** Inclusion criteria: Patients of acute cerebrovascular disease admitted in S. V. R. R. G. G. H., Tirupati were taken in this study. **EXCLUSION CRITERIA:** Head injury cases and neoplasm cases producing stroke were excluded. **RESULTS:** The commonest pathology in acute stroke was infarction, 38 patients, (76%), in which the commonest artery involved was middle cerebral artery. The incidence of intra cerebral haemorrhage was observed in 10 patients (20%). Sub-arachnoid haemorrhage was present in 2 patients (4%).

KEYWORDS: Cerebrovascular disease, infarction, intracerebral haemorrhage, Subarachnoid haemorrhage.

INTRODUCTION: Cerebrovascular diseases include some of the most common and devastating disorders: ischaemic stroke, haemorrhagic stroke and cerebrovascular anomalies such as intracranial aneurysms and arteriovenous malformations. A stroke or cerebrovascular disease is defined by abrupt onset of neurological deficit that is attributable to a focal vascular cause. Thus the definition of stroke is clinical and laboratory studies including brain image are used to support the diagnosis.¹ The clinical manifestations of stroke are highly variable because of the complex anatomy of the brain and its vasculature. It accounts for nearly 1.5% of all urban admissions, 4.5% of all medical and about 20% neurological cases.² The incidence of stroke worldwide is 179 per 100000 population in various parts. In western countries overall prevalence rate is 794 per 100000 populations. The annual incidence of stroke in U. K. is about 350 per 100000 population and in U. S. A. they cause 200000 deaths per year.^{2,3} Stroke is the second leading cause of mortality worldwide and third most common cause of death in the industrialized countries (after heart disease and all types of cancers combined). Hypertension is the most important risk factor for ischaemic and haemorrhagic stroke.

AIMS AND OBJECTIVES: To study the incidence of infarction and haemorrhage in acute stroke cases. This study included 50 patients of acute stroke who were admitted in S. V. R. R. G. G. H., Tirupati.

MATERIALS AND METHODS:

Inclusion Criteria: Patients of acute stroke admitted in S. V. R. R. G. G. H. were included.

Exclusion Criteria: Head injury cases and neoplasm cases causing cerebrovascular disease were excluded from the study.

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The diagnosis of acute stroke was made on the basis of history, clinical examination and CT Scan of brain. After admission a detailed history of stroke, including history of risk factors were taken. Complete neurological examination and other systemic examination carried out.

RESULTS:

TYPE OF STROKE	NO. OF CASES	PERCENTAGE
Ischaemic stroke	38	76 %
Haemorrhagic stroke	10	20 %
Subarachnoid haemorrhage	2	4 %
Total	50	100 %

Table 1: Incidence of infarction, haemorrhage and SAH

TYPE OF STROKE	MALE		FEMALE	
	No. of cases	Percentage	No. of cases	Percentage
Ischaemic stroke	20	40 %	18	36 %
Haemorrhagic stroke	6	12 %	4	8 %
Subarachnoid haemorrhage	1	2 %	1	2 %
Total	27	54 %	23	46 %

Table 2: Incidence of infarction and haemorrhage with reference to sex

TERRITORY	LEFT	RIGHT	TOTAL	%
ACA	1	1	2	5.10 %
MCA	19	13	32	82.05 %
PCA	4	1	5	12.82 %

Table 3: Distribution of infarction with reference to vascular territory

ACA= Anterior cerebral artery; MCA = Middle cerebral artery; PCA = posterior cerebral artery.

TERRITORY	LEFT	RIGHT	TOTAL	%
ACA	0	0	0	0 %
MCA	1	8	9	90 %
PCA	1	0	1	10 %

Table 4: Distribution of haemorrhage with reference to vascular territory

ACA= Anterior cerebral artery; MCA = Middle cerebral artery; PCA = posterior cerebral artery.

DISCUSSION:

Cerebrovascular disease comprises:⁴

- Haemorrhagic infarction (80%).
- Cerebral and cerebellar haemorrhage (10%).
- Subarachnoid haemorrhage (5%).
- Cortical venous and dural venous sinus thrombosis (< 1%).

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Cerebral infarction is mostly due to thromboembolic disease secondary to atherosclerosis in the major extracranial arteries (carotid artery and aortic arch). About 20% of infarctions are due to embolism from the heart and a further 20% are due to intrinsic disease of small perforating vessels (lenticulo striate arteries), producing so called lacunar infarcts.⁵ The middle cerebral artery provides flow to most of the lateral surface of the cerebral hemispheres. And is the vessel most frequently involved in ischaemic stroke.⁶

Approximately 15% of all strokes are due to intracerebral haemorrhage. Primary non-traumatic intracerebral haemorrhage occurs predominantly as a consequence of chronic, poorly controlled hypertension. Hypertensive intracerebral haemorrhage results from degenerative changes in small perforating vessels in the deep regions of the brain (basal ganglia and thalamus), in the cerebellum or brain stem. Ruptured aneurysms are by far the most common source of non-traumatic subarachnoid haemorrhage in about 85% of cases.⁷

Type of stroke	Mikolich et.al.(1981) ⁵	Roy et.al (1991) ⁶	Daniele et.al(2002) ⁷	Present study (2015)
Ischaemic	93.33 %	71.00 %	78.28 %	76 %
Haemorrhagic	6.66 %	29.00 %	21.80 %	24 %

Table 5: Comparison of types of studies

A hospital based cross sectional study was done to know the incidence of infarction and haemorrhage in acute stroke patients. In this study infarction was found in 76% of patients, which was comparable with that found in the studies of Mikolich et. Al,⁸ Roy et. Al,⁹ and Daniele et. Al.¹⁰ i. e., 93.33%, 71.00% & 78.28% respectively. In this study haemorrhage was found in 24 % of patients, which was comparable with that found in the studies of Mikolich et. al, Roy et.al, and Daniele et.al¹¹.i.e., 6.66%, 29.00% & 21.80% respectively. In this study MCA territory is involved in 82.05%, ACA territory is involved in 5.10% and PCA territory is involved in 12.82% of cases. Most common site of haemorrhage is MCA territory.

SUMMARY: The commonest pathology in acute stroke was infarction, 76% patients had infarction. The commonest site of infarction in acute stroke was MCA territory, 82.05% patients had MCA territory infarction. The incidence of subarachnoid haemorrhage is 4%. The commonest site of haemorrhage is MCA territory. Among the patients of haemorrhagic stroke 90% had haemorrhage in the MCA territory.

CONCLUSION: The commonest pathology of stroke is infarction, which is common in the MCA territory, because the MCA is the continuation of internal carotid artery. The commonest site of haemorrhage is in the MCA territory.

REFERENCES:

1. Wade S. Smith, Joey D. English, S. Clairborne Johnston: Cerebrovascular diseases, Harrison's Principles of Internal Medicine, Anthony S. Fauci, M. D., Dannis L. Kasper, M. D., Dan L. Longo, M. D., et. Al., 17th Edition, p – 2513.
2. Mc Allen, J Leuck: Davidson's Principles and Practice of Medicine, 19th Edition, p- 1159-1168.

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3. Wade S. Smith, Stephen L. Hauser, Donald J. Easten.: Cerebrovascular accident, Harrison's Principle of Internal Medicine, 18th Edition, p- 3270-3299.
4. CRA Clarke: Cerebrovascular disease and stroke, Kumar and Clarke Clinical Medicine, Prof. Praveen Kumar, Dr. Michael Clarke, 5th Edition, p-1171.
5. CMC Allen, CJ Lueck, Dennis: Cerebrovascular disease – pathology, Davidson's Principles and Practice of Medicine, Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston, 21st Edition, p-1181
6. Justin A. Zivin: Approach to cerebrovascular disease, Goldman's CECIL Medicine, Lee Goldman, M. D., Andrew I Schafer, M. D., 24th Edition, p- 2305.
7. J Van Gijn: Stroke: Cerebrovascular disease, Oxford Textbook of Medicine, David A Warrell, Timothy M. Cox, John D Firth, 5th Edition, Vol. 3: p-4944-4946.
8. Mickolich JR, Jacob's WC, Fletcher GF: Cardiac arrhythmias in patient with acute cerebrovascular accident, JAMA, 1981 Sept.; 12: 246.
9. Roy MK et. al: ECG changes in cerebrovascular accident, a prognostic parameter, JAPI, 1995; 43: 12-14.
10. Daniele et. al: Stroke and cardiac arrhythmias, Journal of stroke and cerebrovascular disease, 2002, Jan-Feb; 11: 28-33.
11. Dalal P. M.: Cerebrovascular diseases, API Textbook of Medicine, 7th Edition, 2004: p-769-809.

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